

41
~~cooling the thin film to room temperature from the temperature within the supercooled liquid phase region to stop deforming the thin film and thereby forming the thin film-structure.~~

REMARKS

Claims 3-22 are pending. By this Amendment, claim 3 is amended. No new matter is introduced by this amendment.

Entry of the amendment is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because e.g. they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

Reconsideration of the application in view of the foregoing amendment and the following remarks is respectfully requested.

I. CLAIMS 3-22 DEFINE PATENTABLE SUBJECT MATTER

A. The Office Action rejects claims 3-5 under 35 U.S.C. §103(a) in view of "Superplastic Micro-forming of Microstructures", written by Saotome. This rejection is respectfully traversed.

The Office Action asserts that Saotome renders obvious the subject matter of claims 3-5. However, it is respectfully submitted that Saotome does not teach or suggest heating a thin film to where a temperature within the supercooled liquid phase region so that the thin film has a viscous flow between 10^8 - 10^{13} Pa·S and thereby deforming the thin film to be

given shape without the use of an external force, including the thin film to room temperature from the temperature within the supercooled liquid phase region to stop the deforming the thin film and thereby forming the thin film structure, as claimed in claim 3.

As discussed in the Amendment filed October 4, 2001, Saotome discloses a method for micro-forming a material using a V-grooved die. As shown on page 344, col. 1, micro-forming is carried out with a specially developed apparatus that enables a load control from 300 to 100 MPa in a compression punch stress and a punched speed from about .001 to 0.1 mm per second. Thus, as one can see from this disclosure, contrary to the claimed invention, the material is deformed using the weight of the press.

It is also respectfully submitted that Saotome does not disclose that the thin film is heated to a temperature within a supercooled liquid phase region so that the thin film has a viscous flow between 10^8 - 10^{12} Pa·S. In fact, Saotome never mentions or measures the actual viscous flow of the thin film material. Therefore, it is respectfully submitted that Saotome does not teach or suggest the features of independent claim 3.

Accordingly, withdrawal of the rejection of claims 3-5 under 35 U.S.C. §103(a) in view of Saotome is respectfully requested.

B. The Office Action rejects claims, 6, 7 and 9-22 under 35 U.S.C. §103(a) as being unpatentable over Saotome in view of U.S. Patent 5,994,159 to Aksyuk. This rejection is respectfully traversed.

It is respectfully submitted that Aksyuk does not make up for the deficiencies discussed above with respect to Saotome.

Aksyuk teaches a method of fabricating a thin film structure for a micro-mechanical device in which the thin film beam 8 is deformed by an external mechanical force. However, Aksyuk does not teach or suggest a method wherein the thin film is heated to a temperature

within the supercooled liquid phase region so that the thin film has a viscous flow between $10^8 - 10^{13}$ Pa·S, as claimed in claim 3.

Accordingly, due their dependency upon claim 3, claims 6, 7 and 9-22 are also allowable. Withdrawal of the rejection of claims 6, 7 and 9-22 under 35 U.S.C. §103(a) as being unpatentable over Saotome in view of Aksyuk is respectfully requested.

C. The Office Action rejects claim 8 under 35 U.S.C. §103(a) as being unpatentable over Saotome and Aksyuk and further in view of European Patent EP 0 762 167 to Tregilgas. This rejection is respectfully traversed.

Tregilgas teaches a method of producing a thin film structure by forming a beam 24 (see Figure 3F) of an amorphous conductive material. See col. 1, lines 49-53. However, nowhere does Tregilgas discuss an amorphous material which is heated to a temperature within the supercooled liquid phase region so that the thin film has a viscous flow between $10^8 - 10^{13}$ Pa·S. In fact, nowhere does Tregilgas discuss an amorphous material having a supercooled liquid phase region.

In view of the foregoing discussions, it is respectfully submitted that the combination of Saotome, Aksyuk and Tregilgas does not teach, suggest or disclose the subject matter of independent claim 3. Therefore, due to its indirect dependency upon claim 3, claim 8 is also allowable. Accordingly, withdrawal of the rejection of claim 8 under 35 U.S.C. §103(a) in view of Saotome, Aksyuk and Tregilgas is respectfully requested.

II. CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 3 - 22 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Coulter C. Henry
Registration No. P-51,121

JAO:CCH/mdw

Date: January 28, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
--

APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claim:

3. (Twice Amended) A method for producing a thin film-structure comprising the steps of:

forming on a substrate a thin film made of an amorphous material having a supercooled liquid phase region,

heating the thin film to a temperature within the supercooled liquid phase region so that the thin film has a viscous flow between 10^8 - 10^{13} Pa·S and thereby deforming the thin film to a given shape without the use of an external force, and

cooling the thin film to room temperature from the temperature within the supercooled liquid phase region to stop deforming the thin film and thereby forming the thin film-structure.